CLAIMS

1. An apparatus, comprising:

an image projector to project an image;

a set of inherent parameters including a horizontal resolution Wn_0, a vertical resolution Hn_0, a depth d, and a vertical offset db;

a receiver to receive a vertical tilt angle βv and a horizontal tilt angle βh; and

a corrector to compute keystone correction corner points for the image using the set of inherent parameters, the vertical tilt angle βv, and the horizontal tilt angle βh.

2. A projector according to claim 1, wherein the corrector applies formulae

$$xp[x,y] = \frac{\cos[\beta h]\times x}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d}} \text{ and}$$

$$yp[x,y] = \frac{\cos[\beta v]\times y-\sin[\beta h]\times\sin[\beta v]\times x-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d^6}}+\left(db-\frac{Hn_0}{2}\right).$$

3. A projector according to claim 1, wherein the corrector applies formulae

$$xp[x,y] = \frac{\cos[\beta h]\times x-\sin[\beta h]\times\sin[\beta v]\times y}{1+\frac{\sin[\beta h]\times x-\cos[\beta h]\times\sin[\beta v]\times y}{d}} \text{ and}$$

$$yp[x,y] = \frac{\cos[\beta v]\times y-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta h]\times x+\cos[\beta h]\times\sin[\beta v]\times y}{d}}+\left(db-\frac{Hn_0}{2}\right).$$

4. A projector according to claim 1, wherein the receiver is operative to receive the vertical tilt angle βv and the horizontal tilt angle βh from a user.

5. A projector according to claim 1, wherein the receiver is operative to determine the vertical tilt angle βv and the horizontal tilt angle βh relative to a surface.

6. A projector according to claim 1, wherein the corrector performs keystone correction on the image using the keystone correction corner points for the image.

7. A projector according to claim 6, wherein the corrector applies vertical scaling followed by horizontal scaling to the image to perform keystone correction.

8. A projector according to claim 6, wherein the corrector applies horizontal scaling followed by vertical scaling to the image to perform keystone correction.

9. A projector according to claim 1, wherein the receiver includes an adjuster to adjust the horizontal tilt angle βh based on the vertical title angle βv.

10. A projector, comprising:

means for projecting an image;

means for determining a set of inherent parameters including a horizontal resolution Wn_0, a vertical resolution Hn_0, a depth d, and a vertical offset db;

means for receiving a vertical tilt angle βv and a horizontal tilt angle βh; and

means for computing keystone correction corner points for the image using the set of inherent parameters, the vertical tilt angle βv, and the horizontal tilt angle βh.

11. A projector according to claim 10, wherein the means for computing keystone correction corner points includes means for applying the formulae

$$xp[x,y] = \frac{\cos[\beta h]\times x}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d}} \text{ and}$$

$$yp[x,y] = \frac{\cos[\beta v]\times y-\sin[\beta h]\times\sin[\beta v]\times x-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d^6}}+\left(db-\frac{Hn_0}{2}\right).$$

12. A projector according to claim 10, wherein the means for computing keystone correction corner points includes means for applying the formulae

$$xp[x,y] = \frac{\cos[\beta h]\times x-\sin[\beta h]\times\sin[\beta v]\times y}{1+\frac{\sin[\beta h]\times x-\cos[\beta h]\times\sin[\beta v]\times y}{d}} \text{ and}$$

$$yp[x,y] = \frac{\cos[\beta v]\times y-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta h]\times x+\cos[\beta h]\times\sin[\beta v]\times y}{d}}+\left(db-\frac{Hn_0}{2}\right).$$

13. A projector according to claim 10, wherein the means for receiving a vertical tilt angle βv and a horizontal tilt angle βh includes means for receiving the vertical tilt angle βv and the horizontal tilt angle βh from a user.

14. A projector according to claim 10, wherein the means for receiving a vertical tilt angle βv and a horizontal tilt angle βh includes means for determining the vertical tilt angle βv and the horizontal tilt angle βh relative to a surface.

15. A projector according to claim 10, further comprising means for performing keystone correction to the image using the keystone correction corner points for the image.

16. A projector according to claim 15, wherein the means for performing keystone correction includes means for performing vertical scaling followed by horizontal scaling to the image to perform keystone correction.

17. A projector according to claim 15, wherein the means for performing keystone correction includes means for performing horizontal scaling followed by vertical scaling to the image to perform keystone correction.

18. A projector according to claim 10, wherein the means for receiving a vertical tilt angle βv and a horizontal tilt angle βh includes means for adjusting the horizontal tilt angle βh based on the vertical title angle βv.

19. A method for performing keystone correction in a projector, comprising:

determining a set of inherent parameters for the projector, the set of inherent parameters including a horizontal resolution Wn_0, a vertical resolution Hn_0, a depth d, and a vertical offset db;

determining a vertical tilt angle βv;

determining a horizontal tilt angle βh; and

computing keystone correction corner points using the set of inherent parameters, the vertical tilt angle βv, and the horizontal tilt angle βh.

20. A method according to claim 19, wherein computing keystone correction corner points includes applying the formulae

$$xp[x,y]=\frac{\cos[\beta h]\times x}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d}} \text{ and}$$

$$yp[x,y]=\frac{\cos[\beta v]\times y-\sin[\beta h]\times\sin[\beta v]\times x-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d^6}}+\left(db-\frac{Hn_0}{2}\right).$$

21. A method according to claim 19, wherein computing keystone correction corner points includes applying the formulae

$$xp[x,y]=\frac{\cos[\beta h]\times x-\sin[\beta h]\times\sin[\beta v]\times y}{1+\frac{\sin[\beta h]\times x-\cos[\beta h]\times\sin[\beta v]\times y}{d}} \text{ and}$$

$$yp[x,y]=\frac{\cos[\beta v]\times y-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta h]\times x+\cos[\beta h]\times\sin[\beta v]\times y}{d}}+\left(db-\frac{Hn_0}{2}\right).$$

22. A method according to claim 19, further comprising performing keystone correction using the keystone correction corner points.

23. A method according to claim 22, wherein performing keystone correction includes performing vertical scaling followed by horizontal scaling.

24. A method according to claim 22, wherein performing keystone correction includes performing horizontal scaling followed by vertical scaling.

25. A method according to claim 19, wherein determining a horizontal tilt angle βh includes adjusting the horizontal tilt angle βh based on the vertical title angle βv.

26. A method according to claim 19, wherein determining a vertical tilt angle βv includes receiving the vertical tilt angle βv as an input from a user.

27. A method according to claim 19, wherein determining a horizontal tilt angle βh includes receiving the horizontal tilt angle βh as an input from a user.

28. An article comprising a machine-accessible media having associated data, wherein the data, when accessed, results in a machine performing:

determining a set of inherent parameters for the projector, the set of inherent parameters including a horizontal resolution Wn_0, a vertical resolution Hn_0, a depth d, and a vertical offset db;

determining a vertical tilt angle βv;

determining a horizontal tilt angle βh; and

computing keystone correction corner points using the set of inherent parameters, the vertical tilt angle βv, and the horizontal tilt angle βh.

29. An article according to claim 28, wherein computing keystone correction corner points includes applying the formulae

$$xp[x,y] = \frac{\cos[\beta h]\times x}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d}} \text{ and}$$

$$yp[x,y] = \frac{\cos[\beta v]\times y-\sin[\beta h]\times\sin[\beta v]\times x-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta v]\times y+\cos[\beta v]\times\sin[\beta h]\times x}{d^6}}+\left(db-\frac{Hn_0}{2}\right).$$

30. An article according to claim 28, wherein computing keystone correction corner points includes applying the formulae

$$xp[x,y] = \frac{\cos[\beta h]\times x-\sin[\beta h]\times\sin[\beta v]\times y}{1+\frac{\sin[\beta h]\times x-\cos[\beta h]\times\sin[\beta v]\times y}{d}} \text{ and}$$

$$yp[x,y] = \frac{\cos[\beta v]\times y-\left(db-\frac{Hn_0}{2}\right)}{1+\frac{\sin[\beta h]\times x+\cos[\beta h]\times\sin[\beta v]\times y}{d}}+\left(db-\frac{Hn_0}{2}\right).$$

31. An article according to claim 28, the machine-accessible data further including associated data that, when accessed, results in performing keystone correction using the keystone correction corner points.

32. An article according to claim 31, wherein performing keystone correction includes performing vertical scaling followed by horizontal scaling.

33. An article according to claim 31, wherein performing keystone correction includes performing horizontal scaling followed by vertical scaling.

34. An article according to claim 28, wherein determining a horizontal tilt angle βh includes adjusting the horizontal tilt angle βh based on the vertical title angle βv.

35. An article according to claim 28, wherein determining a vertical tilt angle βv includes receiving the vertical tilt angle βv as an input from a user.

36. An article according to claim 28, wherein determining a horizontal tilt angle βh includes receiving the horizontal tilt angle βh as an input from a user.